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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,912	03/22/2001	Perry Robert Czimmek	051252-5116	4677

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EXAMINER

JONES, JUDSON

ART UNIT PAPER NUMBER

2834

DATE MAILED: 08/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/813,912

Applicant(s)

CZIMMEK, PERRY ROBERT

Examiner

Judson H Jones

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 11-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the Hall effect sensor as recited in claim 2, the Giant Magnetoresistive sensor as recited in claim 3, the eddy current sensor as recited in claim 4 and the method of approximating the resistance of the coil by subtracting voltage across a coil from a voltage proportional to a current through a coil as recited in claim 13 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Hasselmark et al. 4,585,978 (of record). Hasselmark et al. discloses a method of controlling a magnetostrictive actuator comprising energizing a coil of an actuator, measuring the amount of flux generated in coil and using the measured flux value as a feedback variable to control the amount of magnetizing force applied to a magnetostrictive member located within the coil as described in column 2 lines 42-65.

In regard to claim 2, see Hasselmark et al. column 3 lines 18-21.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasselmark et al. in view of Wright et al. 6,176,207 B1. Hasselmark et al. discloses the method of controlling a magnetostrictive actuator by measuring the magnetic flux but does not disclose sensing the flux with a Giant Magnetoresistive (GMR) sensor. However Wright et al. teaches the equivalence of GMR sensors, Hall sensors, eddy current sensors and using voltage as the time derivative of the flux in column 4 lines 6-11. Since Wright et al. and Hasselmark et al. are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a GMR sensor in the device of Hasselmark et al. in order to increase the reliability of the device by avoiding Hall effect sensor failures.

In regard to claim 4, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized an eddy current sensor for flux information in the device of Hasselmark in order to reduce the cost of the device.

In regard to claim 5, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized the method of measuring a voltage across a sense coil to obtain flux information in order to reduce the cost of the device.

In regard to claim 7, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized the method of measuring a voltage across an unused drive coil instead of providing a separate sense coil in order to reduce the size the magnetostrictive actuator and thus allow it to be used for applications in which space is restricted. See Wright et al. column 4 lines 8-10.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hasselmark et al. as modified by Wright et al. as applied to claim 5 above, and further in view of Colley et al. 6,152,372. Hasselmark et al. as modified by Wright et al. discloses the method of measuring flux by measuring the voltage across a coil but does not disclose a separate sense coil. However Colley et al. teaches in column 2 line 63 to column 4 line 3 that a separate sense coil can be used for flux sensing. Since Colley et al. and Hasselmark et al. as modified by Wright et al. are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a separate sense coil in the device of Hasselmark et al. as modified by Wright et al. in order to avoid timing errors and incorrect flux readings if the voltage across the drive coil was incorrectly measured while current was supplied to the coil.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasselmark et al. as applied to claim 1 above, and further in view of Japanese reference 4-4776. Hasselmark et al. discloses the method of controlling a magnetostrictive actuator but does not disclose correcting varying the amount of flux applied depending on the temperature of the actuator. However the Japanese reference teaches detecting the temperature of a field generating

coil for a magnetostrictive element and correcting for thermal variations in the English translation of the abstract.

In regard to claim 9, see Hasselmark et al. column 5 lines 10-26 which teaches a position command signal (i.e., a first setpoint level) and a correction signal both being fed to a summing junction that produces a modified position command signal (i.e., a second setpoint level). Figure 1 of the Japanese reference shows a signal from a temperature sensitive element going to box 51, to box 52, to box 31 and finally to box 32. Another input for box 32 comes from box 33, which supplies a first setpoint level. After being modified by the thermal correction factor, a second setpoint level is used to supply power to the coil. (A complete translation of the Japanese reference will be provided in the next office action.)

***Allowable Subject Matter***

Claims 10-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not disclose or teach basing a thermal correction factor on the resistance of the drive coil for use with a method of controlling a magnetostrictive actuator as recited in claim 10.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Blalock 6,028,382 teaches that the resistance of conductors varies with temperature in column 3 lines 30-33 but teaches using specially constructed conductors for temperature detection instead of using the resistance of the coil as recited in claim 10. While low resistance

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copper wire suitable for coils could be used for temperature detection if the changes in resistance were calibrated with the change in temperature of the wires and if a precise measurement of temperature was not needed, Blalock and the other prior art references do not teach doing this. Alternatively conductors that have a high resistance change when heated could be used for coil wires, but the prior art of record does not teach that method either.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Judson H Jones whose telephone number is 703-308-0115. The examiner can normally be reached on 8-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 703-308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3431 for regular communications and 703-305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JHJ  
August 18, 2002

Judson Jones  
AU 2834